Light and Lighting

XX.—No. 11 November, 1937 Price 9d.

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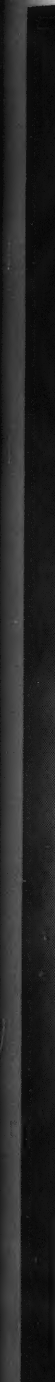

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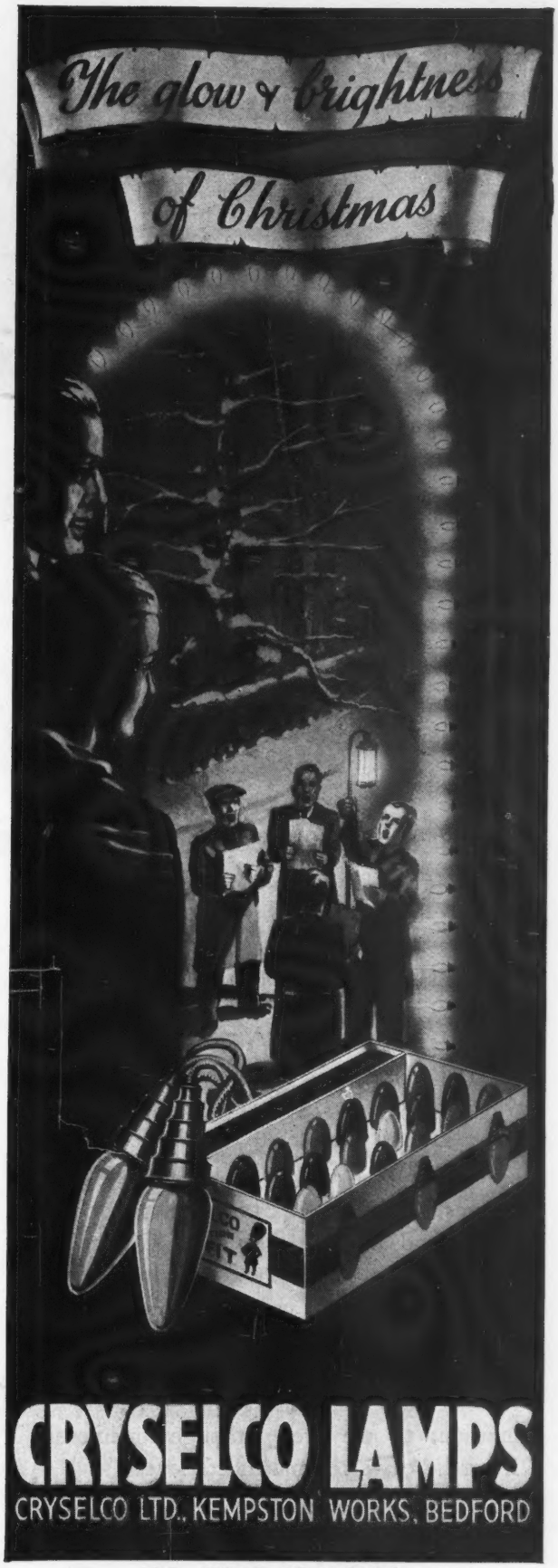

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LIGHTING installations must be considered individually. So many factors arise; the character of the buildings, their decorative treatment and the purposes for which they are used vary so greatly that it is rarely possible to work to definite formulæ.

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The resulting confusion is not helpful to those who would arrive at a definite assessment of lighting requirements for any individual need. "Suitability for purpose" must be the rule, and it usually will be found that the *eyes* which have to function under the lighting to be installed are the surest means of judging the intensity and quality of illumination.

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Incorporating "The Illuminating Engineer."

Light and Lighting

Official Journal of the Illuminating Engineering Society.

32, Victoria St., London, S.W.1.

Edited by J. STEWART DOW

Telephone: Victoria 5215

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Principal Contents:

What Next, Little Man?

THE Title of a Famous Novel.

It may well be addressed to the ratepayer—the man in the street—the "little man," who has read the final report of the M.O.T. Committee on Street Lighting.

This final report crystallises views of experts and amplifies technical recommendations. But it does not carry the previous recommendations on the serious administrative problems much further—perhaps this could hardly be expected.

Whatever be the exact machinery devised and the precise powers taken there must surely be *some* form of central supervision, utilising expert guidance and ensuring financial aid where needed, so that the "lighting of the King's Highway" may be treated as a matter of national concern.

The gulf between desire and performance in the lighting of our roadways is probably greater than in any other field of lighting.

In the long run it is the "little man," the ratepayer, with whom the decision rests. When he is led to understand what good lighting of roads and streets really means to him, he will not only sanction fair expenditure. *He will demand it.*

I.E.S. Activities

The programme for the Session, containing over fifty items, has undoubtedly started with éclat. All available space was filled to capacity for the opening general meeting in London, where over sixty new applicants for membership were announced. Encouraging meetings of Special Sections and Local Centres have been held. We learn that the meeting of the newly-formed North Midland Area Local Centre on September 20, when an address was given by Mr. A. W. Beuttell, and the subsequent gathering on October 18, at which Mr. J. F. Colquhoun gave an address on street lighting, were very successful. It is pleasing to note that our old friend, Mr. S. B. Langlands presided at the meeting in Glasgow on November 4, when an exhibition of lighting fittings was arranged. The opening meeting of the North Western Area on October 19 was addressed by Mr. A. Cunnington, who, like Mr. Beuttell, travelled up from London specially for the purpose.

At the moment of writing, two opening meetings of Special Sections have been held. Mr. J. E. Iliffe's address to the Industrial Lighting Section (October 19) on "The Economics of Factory Lighting" led to an interesting discussion; whilst the first meeting of the Public Lighting Section on October 29, when Dr. Paterson gave the inaugural address and members visited the G.E.C. Research Laboratories at Wembley, went with a swing.

Appraisement of Lighting

We must also mention Dr. Paterson's Guthrie lecture (October 22) on "The Appraisement of Lighting," which was illustrated by many delightful demonstrations and attended by a numerous contingent of members of the Society. Further reference will be made in this journal and in the Transactions to all these events.

Lighting of Factories and Workshops

Departmental Committee Appointed

The Home Secretary has appointed a Committee to review, in the light of existing knowledge and practice, the recommendations made in the reports presented in 1915, 1921, and 1922 by the Departmental Committee on Lighting in Factories and Workshops concerning the conditions necessary to secure adequate and suitable illumination in such works or in any class or description thereof or for any particular process, and to advise about standards of sufficient and suitable lighting proper to be prescribed by regulations under section 5 (2) of the Factories Act, 1937.

The members of the Committee are:—

Mr. D. R. Wilson, C.V.O., C.B.E., H.M. Chief Inspector of Factories (chairman), Mr. J. S. Dow (secretary of the Illuminating Engineering Society), Mr. John A. Gregorson (general secretary of the Iron and Steel Trades Employers' Association), Miss Florence Hancock, Professor H. Hartridge, F.R.S., M.D., M.R.C.P., Mr. C. S. Myers, C.B.E., F.R.S., M.D. (Principal of the National Institute of Industrial Psychology), Sir John Parsons, C.B.E., F.R.S., M.B., B.S., Mr. William Scholes, A.R.C.S. (of Messrs. Bleachers' Association, Limited), Mr. G. W. Thomson, Mr. J. W. T. Walsh, D.Sc. (of the National Physical Laboratory), and Mr. H. C. Weston (of the Industrial Health Research Board).

Mr. Gregorson and Mr. Scholes were nominated by the National Confederation of Employers' Organisations and Mr. Thomson and Miss Hancock by the Trades' Union Congress.

The secretary of the Committee is Mr. R. W. Daniel, to whom all communications should be addressed at the Home Office, Whitehall, S.W.1.

I.E.S. Meetings

LONDON.

Nov. 9th. Addresses on the **Lighting of the International Exhibition in Paris** by Monsieur J. DOURGNON and Mr. R. O. SUTHERLAND at the Opening Meeting of the Decorative Lighting Section of the Illuminating Engineering Society (*Institution of Mechanical Engineers, Storey's Gate, London, S.W.1*); **6.30 p.m.**

Nov. 16th. Mr. S. ANDERSON and Mr. W. R. STEVENS on **Lighting for Special Industrial Processes** (Joint Meeting of the Industrial Lighting Section of the Society and the Association of Supervising Electrical Engineers) (*E.L.M.A. Lighting Service Bureau, 2, Savoy Hill, London, W.C.2*); **6.45 p.m.**

Nov. 23rd. Dr. W. M. HAMPTON on **The Photometry of Projectors** (Meeting of the Photometry Section of the Illuminating Engineering Society) (*Demonstration Theatre of Holophane Ltd., Elverton Street, Vincent Square, S.W.1*); **6.30 p.m.**

Dec. 7th. Visit (Industrial Lighting Section of the Illuminating Engineering Society) to the Printing Works of Messrs. Waterlow and Sons, Ltd.; **6 p.m.**

Dec. 10th. Discussion of **Problems in Decorative Lighting** to be presented by various Architects (Decorative Lighting Section of the Illuminating Engineering Society); **6.30 p.m.**

Dec. 14th. Mr. DEAN CHANDLER on **Incandescent Gas Lighting** (General Meeting of the Illuminating Engineering Society) (*Institution of Mechanical Engineers, Storey's Gate, London, S.W.1*): **6.30 p.m.**

MANCHESTER.

Nov. 12th. Mr. H. E. CHANCELLOR on **Gas Lighting** (North-Western Area Local Centre of the Illuminating Engineering Society) (*College of Technology, Sackville Street, Manchester*); **7.15 p.m.**

Dec. 13th. Mr. J. SWARBRICK on **Measurement of Daylight in Buildings** (North-Western Area Local Centre of the Illuminating Engineering Society) (*Engineers' Club, Albert Square, Manchester*); **7.15 p.m.**

LEEDS.

Nov. 15th. Floodlighting with Electricity and Gas (North-Midland Area Local Centre of the Illuminating Engineering Society) (*Electricity Showrooms, The Headrow, Leeds*); **7 p.m.**

Dec. 13th. Mr. R. GILLESPIE WILLIAMS on **Decorative and Colour Lighting** (North-Midland Area Local Centre of the Illuminating Engineering Society) (*Leeds City Tramways Social Club Concert Hall, Swinegate, Leeds*); **7 p.m.**

GLASGOW.

Nov. 4th. Exhibition of Lighting Fittings (Scottish Local Centre of the Illuminating Engineering Society) (*Royal Technical College, Glasgow, C.1*); **7.30 p.m.**

Dec. 8th. Mr. T. M. LAPPIN on **Electric Lamps, Their Specification and Testing** (Scottish Local Centre of the Illuminating Engineering Society) (*"The Gordon," 19, Gordon Street, Glasgow, C.1*); **7.30 p.m.**

DUBLIN.

Nov. 2nd. Mr. J. CREAGH on **Home Lighting** (I.F.S. Local Centre of the Illuminating Engineering Society) (*Engineers' Hall, 35, Dawson Street, Dublin*); **8 p.m.**

Dec. 7th. Dr. S. ENGLISH on **Glassware in Relation to Illuminating Engineering** (I.F.S. Local Centre of the Illuminating Engineering Society) (*Engineers' Hall, 35, Dawson Street, Dublin*); **8 p.m.**

E.L.M.A. 36th Illumination Design Course

At the opening meeting of the above course on October 11 there was an excellent attendance. Mr. W. J. Jones dealt largely with better lighting in the home. Some reference was made to the efforts of "home lighting advisers" in the United States, and the lecture was illustrated by many effective demonstrations.

A new departure in connection with this course is the practice of inviting editors to open the discussion. At the opening meeting Mr. J. S. Dow, editor of "Light and Lighting," did so. Mr. O. C. Pawsey. editor of "Electrical Trading," spoke at the second meeting on the following Monday, which was addressed by Mr. L. E. Bucknell. The editors of "The Electrical Times," "The Electrician," and "Electrical Industries" were announced to open subsequent discussions.

New Lighting in Hackney

The scheme of improved lighting in Hackney was officially inaugurated by the Mayor (Alderman H. W. Butler, J.P.) on October 5. The complete scheme involves the relighting of 23 miles of main traffic roads to B.S.S. Class "E," 19 miles of secondary roads to Class "G," and 72 miles of residential roads to Class "G" standards—suitable grading being provided at junctions of secondary and residential roads with main traffic routes so as to reduce the difference in illumination to a minimum. One thousand G.E.C. Di-fractor lanterns, mounted 25 ft. high and equipped with 400 watt Osira electric discharge lamps, are to be installed on the 23 miles of main thoroughfares; but pending the complete change-over from A.C. to D.C. which is now taking place 500 watt Osram (filament) lamps are being used in certain streets. Side street lighting is being mainly carried out by Osram lamps installed in Holophane fittings.

Road Lighting and Road Surfaces

We notice that the relation between road lighting and road surfaces and the methods of lighting to be pursued on town and country roads—two topics touched upon in Mr. Cunnington's recent address—were discussed in an excellent survey by Dr. Merry Cohu contributed to the international conference held in connection with the Paris Exhibition. Dr. Cohu remarked that on main roads in and near large towns, closely spaced, high-power lighting units could usually be adopted. It is then possible to provide a level of illumination which at once allows easy and exact perception of obstacles and also removes many difficulties inherent at weak illuminations. But conditions are different when the length of the route and the economic conditions only permit widely spaced units of relatively low candle power. In these circumstances the detection of an object, rather than perception of its exact nature, is all that can be achieved. This detection is effected mainly by observation of the object against a bright background. Dr. Cohu went on to illustrate the differences in the appearance of roadways when wet and dry, and pointed out that some of the latest types of fittings aim at effecting a compromise between the requirements of diffusing and regularly reflecting surfaces. Systematic observation of the qualities of road surfaces is evidently very desirable, whilst international co-operation is needed in two main directions: first, in determining the effect of colour of light from sources on the appearance of objects on the roadway and the perception of them, and, secondly, in establishing the necessary minimum of contrast for the perception of objects against a bright background.

Better Street Lighting

Final Report of Ministry of Transport Departmental Committee.*

Greater Uniformity Desired—Responsibility to be confined to Large Administration Units—Grants from National Funds—Competent Engineers Needed—Traffic Routes and Other Roads——Mounting Height, Spacing, and Lantern Output—Limits to Overhang—Dual Carriageways — Effective Maintenance — All Night Lighting—Artificial Light-Coloured Backgrounds—Illuminated Guard Posts or Refuges—British Standard Specification Essential.

It will be recalled that the M.O.T. Committee, which was appointed in June, 1934, and issued an interim report in September, 1935, was composed of nine members. Of these, four (Mr. J. F. Colquhoun, Mr. C. A. Masterman, Dr. C. C. Paterson, and Dr. J. W. T. Walsh) are members of the Illuminating Engineering Society; two (Mr. F. C. Cook, the Chairman, and Mr. E. S. Perrin) are associated with the Ministry of Transport; one (Mr. J. R. Taylor) is associated with the Ministry of Health; and two (Major W. H. Morgan, County Engineer, Middlesex, and Major L. Roseveare, Borough Engineer, Eastbourne) are officers of local authorities. The secretary (Dr. H. F. Gillbe) is also associated with the Ministry of Transport.

Administrative Problems.

The Final Report issued on Nov. 2, recalls the main conclusions of the Interim Report† including the estimate that lighting to an appropriate standard (approx. a generously planned Class F [B.S.S.]) would cost £300 to £400 per mile and might involve an annual expenditure of £3,500,000. Since the issue of the Interim Report the M.O.T. has been empowered to light certain roads. (Trunk Roads Act, 1936.) The recommendations previously made in regard to the administration of public lighting are confirmed.

Some difficulty has been experienced in agreeing a satisfactory basis of classification of roads according to lighting requirements. The most practicable method is judged to be a division into (A) Traffic Routes and (B) Other Roads, both of which are considered in the recommendations now made. Distinctive thoroughfares in large cities, for which very high standards of lighting are properly demanded, fall outside this broad classification.

Traffic (Class A) Routes.

Dealing with Traffic Routes the Committee reviews the chief conditions put forward in the Interim Report. The original mounting height of 25 ft. is confirmed (though an occasional departure to, say, 22 ft. is not regarded as justifying replacement of existing installations). Short posts may be fitted with extension pieces and other temporary expedients may be adopted. But it is preferable that unsatisfactory lighting should be replaced by installations designed in accordance with the recommendations, even though this may involve some years delay.

"Overhang" should bear some relation to width of carriageway. The maximum usually feasible without causing the visibility of kerbs to suffer is about 6 ft. When the carriageway is not more than 30 ft. wide lamps should be sited vertically above the kerb. On wider roads an overhang equal to half the difference between the width of roadway and 30 ft. is advised. On straight roads of more than 40 ft. wide additional central sources are needed. With "non cut off" fittings central suspension is undesirable except when special circumstances (e.g., narrowness of the road, borders of trees, etc.) make it expedient. In the case of "cut-off" fittings, however, further experience is necessary. A staggered arrangement is most suitable for general adoption on straight roads. A recommendation is made that the amount of light to be provided per 100 ft. linear of roads having a carriageway not more than 40 ft. in width should lie between 3,000 and 8,000 lumens.

Nature of Road Surfaces.

The report recalls the main conditions influencing glare and emphasises the importance of the nature of the road surface. Road engineers can help by using light-coloured materials for surfacing and avoiding those which produce a very dark matt surface or that rapidly become highly polished. Marked variations in colour and texture of road surfaces would be avoided. Light-coloured kerbs, however, are helpful.

Dual carriageways present a new problem. It should be possible to achieve satisfactory visibility for uni-directional traffic on each carriageway and also to reduce glare and distraction by suitable modifications of the distribution. But on these points further experience is needed .

Other (Class B) Roads.

The conditions of lighting on other (Class B) roads are next discussed in general terms. For such roads a lower mounting height (13 ft.-15 ft.) and spacing distance (120 ft. max.) and an output from lanterns of 600-2,500 lumens per 100 ft. linear is advised.

Illumination measurements, by reason of their relative simplicity, provide a practicable means of assessing the state of maintenance. Measurements may conveniently be made in a horizontal plane, but the conditions of test are best described by a formal specification. Effective clauses dealing with adequate maintenance should continue to form an integral part of the British Standard Specification for Street Lighting.

All Night Lighting Preferred.

The concensus of opinion is that street lighting should continue throughout the hours of darkness (i.e. from dusk to dawn, approx. 4,000 hours per annum) mainly on account of safety and police requirements but also in view of the growth of night traffic. High standards in shopping areas may, however, be diminished to traffic levels. Artificial backgrounds as an aid to visibility, should be encouraged.

Attention is drawn to the police aspect, i.e., the lighting of public passages and places which might otherwise be used for offences, and of areas in the vicinity of exits and entrances to all public resorts. Methods of rendering officers on point duty at road junctions conspicuous, e.g., by means of powerful beams from overhead are approved.

Refuges, Nameplates, Etc.

Other topics discussed include the illumination of guard posts on refuges, the desirability of siting nameplates in relation to street lamps so that they may be easily read and the use of street lamps as warning devices. Fog conditions vary so greatly that they should not be regarded as a main factor in planning street lighting.

In conclusion it is urged that the recommendations in this Report should be implemented, with the minimum of delay, by the issue of a formal specification by the British Standards Institution.

Acknowledgment is made of the aid of the Barnes Borough Council in providing a site for a special

* Ministry of Transport Departmental Committee on Street Lighting Final Report (August, 1937). His Majesty's Stationery Office, London. 9d. net.

† Light and Lighting, Nov., 1935.

experimental installation, of the help of the various organisations who gave evidence before the Committee, and of the able services of the secretary of the Committee (Dr. H. F. Gillbe).

Conclusions and Recommendations

The following is a summary of the list of recommendations completing the Report:—

Recommendations from Interim Report.

1. The following conclusions and recommendations which were set out at length in the Interim Report* are reaffirmed:—

(a) There should be reasonable uniformity in the lighting of portions of traffic routes presenting similar characteristics, but minor variations are not necessarily disadvantageous.

(b) The present system of administration is not conducive to the achievement of uniform and effective lighting on traffic routes.

(c) Consideration should be given to the responsibility for the lighting of traffic routes being confined to large administrative units, and to the suggestion that the cost of lighting roads should be aided by grants from national funds administered by the responsible Government Department.

(d) Adjoining authorities should confer together with the object of securing uniformity of lighting on routes of common interest.

(e) Lighting authorities should be advised by an engineer competent to deal with street lighting.

(f) Power to control extraneous lighting should be given to lighting authorities, but only in so far as it may be seriously detrimental to the street lighting.

(g) Street lighting installations should be complete in themselves, and no reliance should be placed on extraneous lighting.

(h) Authorities contemplating the erection or modification of a street lighting installation in the vicinity of a railway line should notify the railway company beforehand with a view to avoiding possible interference with railway signals.

Two Ranges of Lighting.

2. Two ranges of lighting should be adopted, for traffic routes (Group A) and other roads (Group B), respectively, with a definite gap between them.

Recommendations for Traffic Routes.

3. On traffic routes:—

(a) The mounting height should be of the order of 25 ft.

(b) The average spacing should not exceed 150 ft., or, where economically practicable, 120 ft.; the maximum spacing in any one span should be 180 ft.

(c) The overhang of the lanterns should vary according to the width of the carriageway.

(d) On straight sections of road sources should be placed on both sides of the road in staggered formation; additional central sources should be placed in every third span when the carriageway width exceeds 40 ft.

(e) On bends the sources should be placed on the outside of the curve. Particular attention should be given to siting at bends, junctions, and intersections.

(f) Central suspension should in general be avoided, except as noted in Paragraph 40.

(g) The lantern output per 100 ft. linear should be between 3,000 and 8,000 lumens, according to the conditions prevailing on the highway and the type of installation.

(h) Excessive glare may be largely avoided if the ratio used to express the concentration of the light does not exceed six, or preferably five.

(i) Pending the results of further experience, dual carriageways should be lighted as though each carriageway were an independent traffic route; additional lighting required, e.g., for service roads, should be of the type we recommend for Group B roads.

Recommendations for Other Routes.

4. For roads other than traffic routes:—

(a) The mounting height should be between 13 ft. and 15 ft.

(b) The average spacing should not exceed 120 ft., with a maximum of 150 ft. for any one span.

(c) Attention should be given to siting on the same principles as are recommended for traffic routes, especially at bends, junctions, and intersections.

(d) The lantern output should provide between 600 and approximately 2,500 lumens per 100 ft. linear, according to the conditions prevailing on the road and the type of installation.

(e) Part of the available light should be directed towards the lower parts of the fronts of buildings.

(f) The ratio used to express the concentration of the light should not exceed 4, or preferably 3.

General Recommendations.

5. The recommendations should be implemented by the issue with the minimum of delay of a formal specification.

6. Effective clauses dealing with adequate maintenance should form an integral part of the British Standard Specification, and should be applied by those responsible for street lighting.

7. Gradation is necessary only where there is considerable variation in the lighting level along a traffic route.

8. Street lighting should be continued from dusk until dawn, i.e., for approximately 4,000 hours per annum, unless financial considerations render this impracticable.

9. Attention should be given to the provision of artificial light-coloured backgrounds in appropriate cases.

10. Due regard should be paid to police requirements in respect of the lighting of entrances, etc., and special lamps, additional to the installation proper, should be provided where necessary.

11. Illuminated guard posts on refuges should be lighted in accordance with the detailed recommendations given.

12. Street name plates should be so sited in relation to street lamps that they may be read without difficulty by drivers at night.

13. No attempt should be made to use street lamps of distinctive colour as warning signs.

14. Inadequate lighting of traffic routes should be raised to the level recommended as financial conditions permit, and not to a level intermediate between those recommended for Groups A and B.

15. The trend of design of lighting installations must have regard to the nature of the materials available for road surfacing and surface dressing, but the provision and maintenance of surfaces which are light in colour and as uniform as possible in respect of colour and texture are definitely advantageous.

*Light and Lighting, ex. cit.

Dr. S. English's Presidential Address

Delivered at the Opening Meeting of the Illuminating Engineering Society, on October 12, 1937.

More Original Research—Improving the Transactions—Education and Professional Status—Need for Independent Experts—Lighting in the New Factory Act—Growth of the Society's Activities—An Annual Convention?

Dr. English took as a starting point in his address the suggestions of one of his predecessors, Mr. Hepworth Thompson, whose great aim was to raise the status of the Society. He urged the desirability of obtaining papers embodying results of original research, so that the "Transactions" would come to be regarded as a mine of information on lighting problems, not obtainable elsewhere. Senior members of the Society should encourage their assistants to undertake original work under suitable guidance. Such experience fostered a critical and impartial attitude such as is particularly desirable in the lighting industry, where a choice between different systems of lighting has constantly to be made. In general, the speaker urged that sections should not imitate too closely the methods adopted at general monthly meetings, but should devote evenings to two or three short papers all dealing with some particular problem.

Sir John Parsons once remarked that in no field of science were so many types of scientific workers involved as in the study of visual processes. Every branch of illuminating engineering contacts with one or other sister science, and this borderland provides innumerable problems for solution. In illustration of this fact, Dr. English recalled an experience of his own in studying the composition of glass and its viscosity. He showed how knowledge acquired in these experiments had proved of value years afterwards in revealing the cause of breakages of glass refractors used with gas street lamps, and in suggesting the remedy he felt sure that other investigators could mention similar cases.

The importance of attracting contributions containing such "new knowledge" to the Society's "Transactions" is evident. There should be available an increased volume of suitable papers. It must always be remembered, Dr. English continued, that the receipt of the publications with which the Society was associated was the main advantage which many members derived from their connection with the Society. The present arrangement, initiated only two years ago, was working well. The additional publicity which the Society received in an informal way, in "Light and Lighting," served to make the Society's work more widely known and attracted new members. But the "Transactions" should be brought to the notice of leading specialists in illumination and should find a place in the leading scientific and technical libraries, at home and abroad.

Dr. English next discussed the technical education and training of young men entering the industry and intending to make it their life work. This matter was being studied by a strong joint committee. But in the meantime he would like to see one of the London technical colleges providing lectures and laboratory facilities for illuminating engineering. Such a school would be of great value both to the lighting industry and to the Society. It would help to develop a well-qualified type of member who, after a few years' experience in the industry, would attain a standing such as might be recognised by the grant of a diploma by the Society, or by their election, along with others of proved merit, to a special class of membership.

This matter of education and professional status affects the serious problem to which Mr. Cunnington, in his Presidential address last year, made reference—that of providing independent experts on illumination such as might enter the service of Government departments, local authorities, and important industrial and transport undertakings. The absence of such positions is evidence of insufficient recognition by such bodies of the importance of illumnation, but is also probably due to the fact that, as yet, no "hall mark" exists by which those having a sound knowledge of illuminating engineering may be identified. In this connection the President recalled the inclusion this year of "adequate and suitable lighting" as a definite requirement in the Factory Acts, a step long advocated by one of the Society's past-presidents, the present Chief Inspector of Factories, Mr. D. R. Wilson. This notable step, whilst giving a great incentive to better factory lighting, should furnish new opportunities for independent experts in this field.

In conclusion, Dr. English drew attention to the development of the four special sections devoted to photometry, industrial lighting, public lighting, and decorative lighting, and the four informal local centres with headquarters in Manchester, Leeds, Glasgow, and Dublin. As a result, the programme of meetings had grown from a single sheet to an eight-page leaflet. Whereas, until recently, the Society was content with eight meetings during the year, it was now providing for about fifty!

This growth, Dr. English remarked, was a triumphant indication of the vigour of the Society, but it brought in its train another problem. Members of these expanding local sections should have opportunities of getting to know each other. He suggested that this might be done by organising an annual convention at some convenient central resort—preferably extending over two or three days in May, so as not to clash with other engagements of a similar nature in the autumn.

DR. S. ENGLISH
President of the Illuminating Engineering Society (1937-1938).

Dr. S. English, who is a Director of Holophane, Ltd., and in charge of its Research Laboratory, joined the Society in 1927. He has taken a keen interest in the welfare of the Society, and has contributed several papers of considerable interest.

Progress in Illumination

Some Notes on the Exhibits at the Opening Meeting of the Illuminating Engineering Society on October 12th, 1937.

The list of exhibits at the I.E.S. opening meeting on October 12 was quite as numerous as in previous years, and the lecture theatre of the E.L.M.A. Lighting Service Bureau was crowded to capacity.

New Features at the Bureau.

The initial event consisted, as usual, of some introductory remarks by Mr. W. J. Jones, who referred briefly to the new features at the Bureau, and especially to the architectural lighting theatre studio designed by Mr. R. O. Sutherland. Exhibits in this room illustrate the main principles of cornice lighting and illumination from built-in panels, and the applications of electric discharge lamps for architectural lighting effects. Open and closed varieties of "coving" are shown. One exhibit enables architects to study the effect of various translucent materials suitable for panels. Decorative lighting effects involving rods, prisms, lenses, and moulded glass tiles, acid-etched crystal glass plates illuminated by coloured light, and tinted mirrors fitted with coloured architectural lamps are shown. Architects are given opportunities of testing the reflecting power of twelve different types of wall surfaces. Other special objects included a decorative panel executed in fluorescent powder and oil colour illuminated alternatively by ultra-violet and ordinary light from ordinary filament lamps; a selection of method for lighting shelves so arranged that the unit itself forms a mural feature; a polished birch plywood ceiling grille indirectly lighted; an interesting design obtained from perforated metal cylinders; and a pleasing exhibit showing the action of light on corrugated surfaces used as decorative panels.

The Portable Projector Light Meter.

Mr. Jones also gave a demonstration of the new portable projector light meter, which has figured in many recent demonstrations. In this device the moving parts of the instrument used in a physical photometer, together with the scale and pointer, are transferred to a portable lantern so that an image of the pointer and scale is projected on to a screen. A flexible cord connects from the instrument to the photoelectric cell, which can be carried from place to place and exposed in different situations, all readings being revealed by the motions of the projected image of the pointer. This device enables the candle-power emitted by a fitting in various directions, the degree of uniformity of illumination in a room, or the values of illumination successively obtained by various groupings of lighting units, to be clearly exhibited to quite a large audience.

New Types of Electric Lamps.

Amongst the new lamps shown by Mr. Jones on behalf of the members of the E.L.M.A. was a 400-watt mercury electric discharge lamp mounted in a bulb, the interior of which is coated with fluorescent powder. The ordinary efficiency of thirty-eight lumens per watt is maintained, and the conversion of ultra-violet radiation into visible light by the powder produces a striking change in colour. The lamp is stated to emit 6 per cent. of red light, as compared with only 2 per cent. from the ordinary lamp.

Another novelty, to be marketed shortly, is the capillary water-cooled mercury electric discharge lamp operating at 60 lumens per watt. The lighting element, only 1½ inches long, contains a thread of mercury, half an inch long and a fraction of an inch in diameter. This small 500-watt lamp emits 35,000 lumens and has a brightness of 215,000 candles per sq. in. The light is also whiter than that of the ordinary mercury lamp.

The picture shows a corner of the reconstituted Architectural Lighting Studio at the E.L.M.A. Lighting Service Bureau. The effect of the device here illustrated is happy, and there are many other instances of ingenuity in the application of tubular lamps, luminous panels, and patterns of decorative glassware. Lighting effects and decoration, in fact, are becoming very closely blended, as was brought home to some of us at the Paris Exhibition.

Projector "Bipost" lamps, available in 1, 2, and 5 kW. size, utilise, in place of the ordinary cap, two hollow pins welded into a glass dish, which support two posts to which the filament is attached. The bulb is joined to the edge of the glass dish. The filament is thus rigidly and accurately fixed in relation to the base pin, and the lamp can be inserted into projection apparatus without need for expert focusing. The

bulbs are of hard glass and of smaller size than hitherto—a substantial advantage for work of this kind.

Some "Philora" Novelties.

A little later on Mr. E. P. Sayers (Philips Lamps, Ltd.) showed an interesting development of the "Philora" forced cooled mercury lamp of the type described above. This consisted in a floodlight unit equipped with three 200-watt quartz tube lamps, each yielding 120,000 lumens, or 360,000 lumens in all.

A new lamp, resembling the familiar 400-watt mercury lamp but of larger dimensions, consuming 650 watts and furnishing 312,000 lumens, was also shown.

Other items on show included the "Philora" black bulb mercury lamps of 80- and 125-watt size, designed to emit almost entirely ultra violet radiation. Finally, Mr. Sayers showed two fluorescent tubes, each one metre long, consuming 35 watts, and giving 1,000 lumens. A feature of these tubes, which operate on normal mains pressures but are at present in course of development, is the extremely white light produced.

Crompton Neophan Glassware.

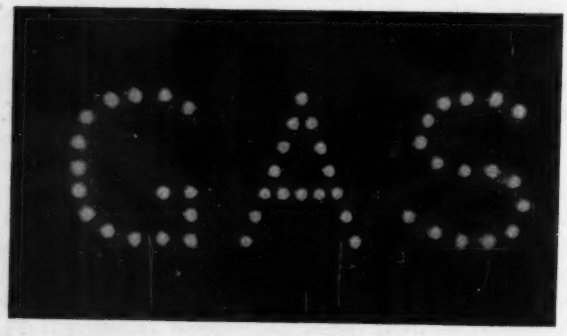
Mr. E. O. H. Thompson (Crompton Parkinson, Ltd.) exhibited the Crompton Neophan glassware, to which reference has recently been made in these columns. It may be recalled that this glass contains "neodym oxide," a constituent which has the property of partially absorbing the preponderating yellow rays in the spectrum but allowing the remaining colours to pass unchecked. This quality was illustrated at the meeting by means of a small spectroscope. When the spectrum of an ordinary tungsten filament lamp was compared with that of one seen through Neophan opal glass the double absorption band in the yellow was clearly evident.

The effect of the glass was also illustrated in a cabinet divided vertically into two portions, one containing a lighting unit equipped with the special glass, and the other a unit of ordinary three-ply opal glass. Both fittings were of similar size and design and were equipped with lamps of similar rating.

The effect of the corrected light on various coloured fabrics, and the influence of the Neophan glassware in causing the colours to appear more fresh and alive, could thus be examined.

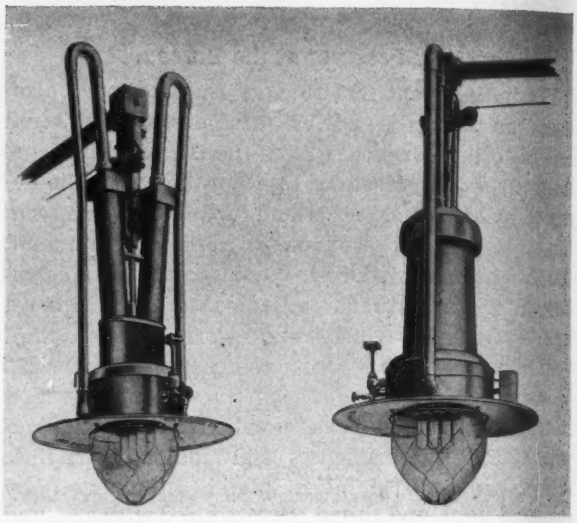
An Interchangeable Gas Sign.

Mr. A. J. Prestage (South Metropolitan Gas Company) exhibited a new sign, outlining the word "GAS," of the type described in our last issue (Oct., 1937, p. 283). This sign applies high-pressure gas lighting with a special form of mantle, which does not require the protection of glass against ordinary weather conditions. Gas at 80 in. pressure is supplied to a burner box on which the specially prepared mantles are screwed in the unburnt condition and are then strengthened to withstand severe treatment.



A New Gas Lamp.

Mr. A. J. Whyte (Keith Blackman, Ltd.) explained that it had been found impracticable to arrange an exhibit of this new gas lamp at the meeting, but a few slides were shown illustrating its general nature. (The lamp was described in detail in Mr. G. Keith's paper at the recent A.P.L.E. Conference at Folkestone.) With this lamp, which operated at ordinary low pressures, an output of 300 lumens per cub. ft. of 500 B.T.U. gas is obtained—an increase in efficiency of 50 per cent. over that of any modern low-pressure gas lamp. The lamp is made in two sizes, one having a consumption of about 45 cub. ft. of gas per hour with four mantles, and the other 30 cub. ft. of gas per hour with three mantles. The illuminating power, it was pointed out, is thus more than twice that of any other low-pressure lamp available. The lamp has definite directional features, which can, when desired, be enhanced by the application of a suitable refractor.

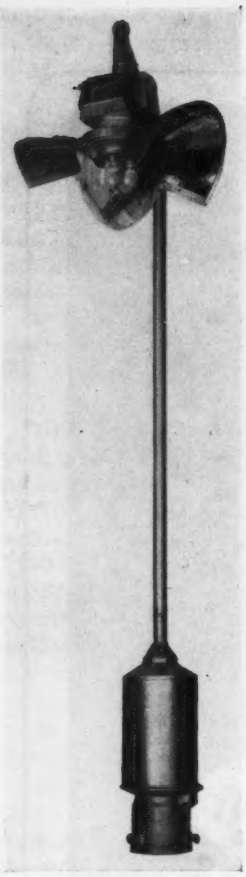


A general view of the new Keith "Magnalux" gas lamp.

The Spiderless Mantle.

Mr. W. Blowes (Falk Stadelmann and Co., Ltd.) showed specimens of the moulded spiderless silk mantle, which, as distinct from the orthodox types generally used, has no "spider" or accumulation of fabric at the bottom end of the mantle. One of the results of this method of manufacture is the advantage of greater lighting efficiency in the spherical plane, the illumination being uniform and not interfered with by a dark patch or area with a lesser intensity, which is unavoidable with the ordinary "spider" mantle. This type of mantle, it was explained, is also more uniform in shape, and retains its shape during its whole burning life, whilst the method of manufacture results in increased strength at the juncture of the fabric to the ring, generally the weakest point in a mantle.

The "Fireglow" mantle was also shown. This burns with a reddish glow, and is used to obtain so-called flame effects for floodlighting, etc.



Sugg's "8,000" Lamp.

Some Other Gas Lamps.

Mr. A. R. McGibbon (Wm. Sugg and Co., Ltd.) showed two forms of lamps, here illustrated. The "Folkestone" lamp, exhibited at the A.P.L.E. Conference and described in our last issue (October 1937, p. 294), uses six mantles in cluster formation and has a "total cut-off" at about 5° below the horizontal. The angle of maximum intensity may be varied between 65° and 72° from the downward vertical, according to the spacing height ratio and reflection characteristics. The lamp incorporates a Zeiss mirror glass reflector, specially treated to resist high temperatures. The accurate control of the light enables values of illumination to be obtained with a minimum gas consumption. The absence of glare is a good feature and conducive to high visibility.

The above lamp is suitable for lighting motor roads. The "8,000" lamp is intended mainly for side street lighting, in new estates, etc. It is supplied as a unit complete with swan-neck and control base. With 9½-ft. columns a mounting height of 14 ft. is obtained. Control gear is neatly housed in the base. The lamp body is of cast aluminium and requires a minimum of maintenance. The mirror glass reflectors may be of either the "two-way" or "three-way" type, and can be adjusted to suit bends of the roadway. At present three sizes, rated at 6¼, 8 or 10 cubic feet per hour, are available.

Mr. J. W. Lintott (C. H. Kempton and Co., Ltd.) exhibited the "Starlyte" lamp, the chief feature of which is an accurately designed mirror system built into the top of the lamp. This reflects light otherwise wasted above the horizontal into the region between 70° and 80° from the vertical. Apart from the improvement in distribution of light the rigid and simple construction of the lamp is advantageous. Another good feature is the absence of directional fittings projecting in the body of the unit, which enables the lamp attendant to work with a maximum of speed and safety.

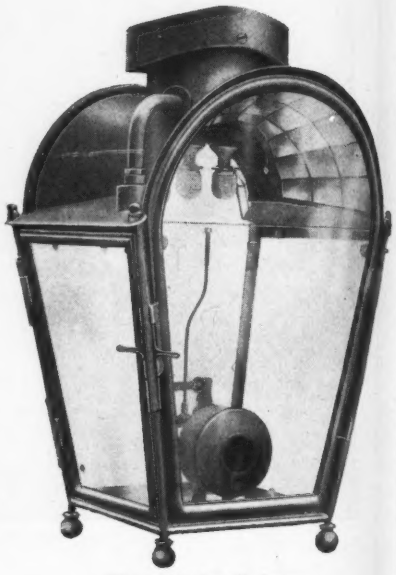
A second unit, exhibited but not yet placed upon the market, is believed to be the most compact spot-lighting device produced in the gas industry. The dimensions of this unit, the "Elm Spotlight" are only 12 ins. x 11 ins. x 11 ins. (including the support for wall fixing) and the weight 10¾ lb. The unit employs a single No. 2 mantle. Concentration of light is effected by a condenser lens, no reflector being used. Provision is made for tilting the lamp as desired.

Mr. W. J. C. Davey (W. Parkinson and Co.) likewise showed several lamps exhibited at the Folkestone Conference, including the Maxill G type for main and arterial roads and the Maxilla Brimax type for residential and secondary streets, which were briefly described in our last issue (October, 1937, p. 292). It will be recalled that the Maxill G. lamp uses a pair of burners (each with 3 to 6 mantles) at the foci of facetted paraboloid reflectors of anodised aluminium. The reflectors are adjustable in both vertical and horizontal planes so as to allow for varying spacing and gradient. The other type of lamp (Brimax Maxilla) is intended for residential thoroughfares, uses facetted butterfly wing reflectors, and is equipped with a gas and air regulator housed in the body of the lamp. The inclusion of a swan-neck as an integral part of the lamp assists increased mounting height and the general appearance is similar to that of the Maxill lamp, so that uniformity of effect in a composite scheme can be attained.

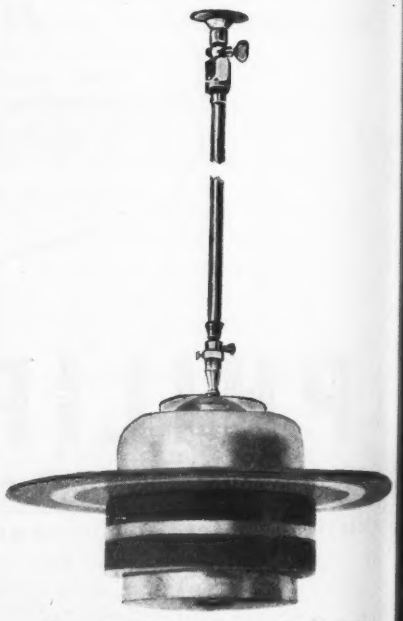
Gas Lighting Fittings.

New types of decorative gas lighting fittings were shown by Mr. W. Blowes (Falk Stadelmann and Co., Ltd.). The adjacent illustration shows the new step pattern "Saturnlite" unit which embodies an 8-in. opaline glass with orange painted rings and a 16-in. ringed plate to match. The unit is equipped with a 3-light bijou Veritas burner and has an overall length of 36 ins. The globe is fitted and removed by tilting at a given angle, which facilitates quick release.

General view of Sugg's "Folkestone" Lamp.



The "Starlyte" Lamp.
(C. H. Kempton & Co. Ltd.).



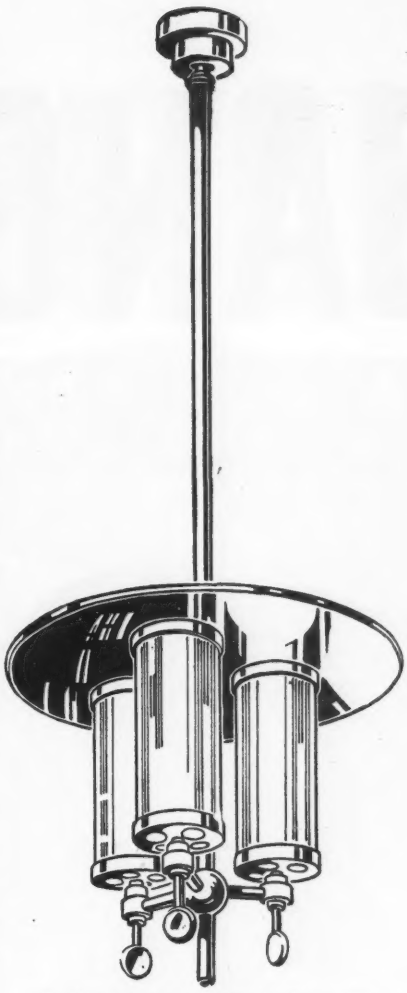
The new Step-up "Saturnlite" Unit.

A Three-tier Opaline Enclosed Gas Unit (Mr. Blowes).

Mr. Blowes also exhibited the 12-in. three-tier opaline enclosed unit, fitted with three-light burner (illustrated on the left). The over-all length is about 36 in. The unit can be used with or without a prismatic dish, and the opening at the bottom enables easy access to burner and mantles. This unit is regarded as specially suitable for schools, offices, showrooms, etc.

Mr. W. Morris (Evered and Co., Ltd.) presented a fitting (illustrated on the right) utilising three one-light burners, each in an obscured pyrex fireproof cylinder giving well diffused illumination. A chromium plated reflector placed on the top edge of the cylinder serves to increase the downward illumination. This fitting provides general lighting and can be used in a wide variety of situations.

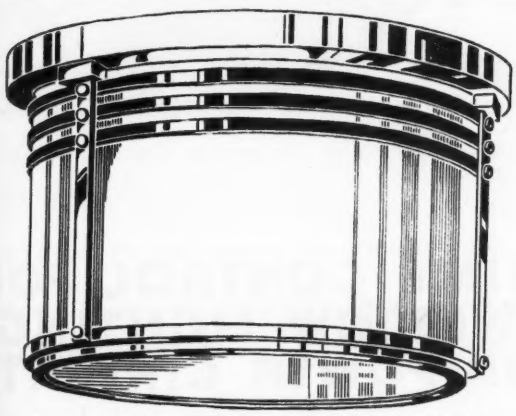
A second type of fitting shown by Mr. Morris is one that is becoming increasingly popular with gas companies for fitting in new showrooms, where it is possible to arrange a ventilating duct to carry off the products of combustion and hot air formed in and around the lamp. The top plate is made with a flange which fits the flue or duct, and the chimney, which is placed over the burner projects into the duct several inches, thus forming an inner and outer track. The constant renewal of the air in the lamp enables the burner to function at its best and a fairly equable temperature is maintained in the room. Where the ventilating duct can be fitted with an exhaust fan it is possible to control the upward current and to ensure perfect functioning of the burner and any degree of ventilation that may be required.



A three-light gas pendant using pyrex cylinders (Mr. W. Morris).

Electric Street Lighting Equipment.

Mr. C. W. M. Philips and Mr. T. Catton (British Thomson-Houston Company, Ltd.) showed a new street lighting lantern utilising a horizontally burning electric discharge lamp. The lantern, shown in the accompanying illustration, makes use of a magnetic deflector to enable the lamp to be burned horizontally, and this horizontal position of the lamp enables a relatively simple and efficient system of light control to be applied. The lower frame of the lantern carries two refractor panels and a diffusing



A gas fitting for use in Showrooms (Mr. W. Morris).

panel is hinged to the main frame and readily lowered or detached, as shown. The method of locking this frame, when raised, is such as to ensure that the lamp is accurately placed in regard to the top reflectors, which are mounted by a special method ensuring preservation of the correct contour.

B.T.H. Mercra "H" Lantern using horizontally burning electric discharge lamps.

Other forms of street lanterns were shown by Mr. J. G. Christopher and Mr. A. G. Brown (General Electric Company, Ltd.) and by Mr. E. E. R. Porter (Metropolitan-Vickers Electrical Company, Ltd.).

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A NEW SMALL SYNCHRONOUS SWITCH OF THE PLUG-IN TYPE

The Sangamo Type SS Time Switch is an entirely new synchronous switch of the plug-in type which has been especially developed to suit the requirements of a wide range of automatic time control applications.

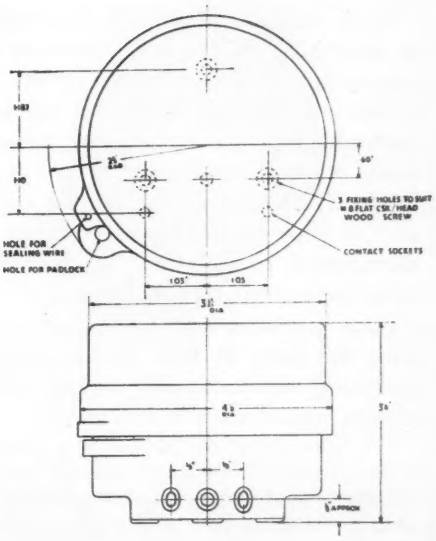
Small in size, simple in design, the switch is suitable for street lighting, neon sign, shop window lighting, heating and power circuit control and is also ideal for use with contactors on multi-phase installations.

Its features, some of which are shown in the accompanying illustrations are such that the switch may be readily adapted to suit the particular needs of any of these applications.

The Switch has single pole single throw silver contacts. It is rated at 10 amperes gasfilled lamp load for 250 volts maximum, and can also be supplied for lower commercial voltages providing that the frequency is controlled.

This Switch is the most modern Time Switch available.

Robust in construction, its reliability has been proved by exhaustive tests over a long period. We shall be pleased to send you full particulars.



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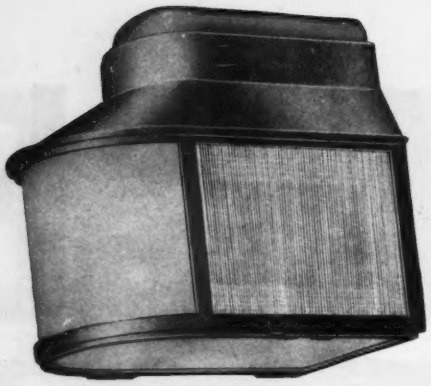
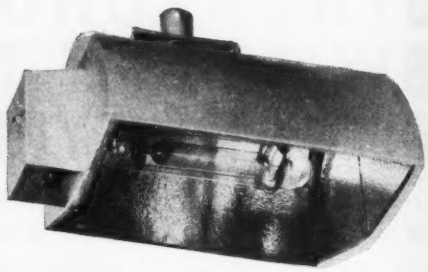


Small "Watford" Lantern.

Open Type ("Pla-Fractor") street lighting unit.

Other types of street lighting units were shown by Mr. J. G. Christopher and Mr. A. G. Brown (General Electric Co., Ltd.). These included a small edition of the familiar "Watford" type lantern, intended for use with 150w. or 250w. Osira lamps and a small type "Oxford" lantern for use with the new 80 watt and 125 watt discharge lamps. The open type lantern here shown also for 80 and 125 watt discharge lamps, is of interesting construction. It consists of a silvered single-piece reflector, moulded on to which is a band of prisms producing a non-axial light distribution. The other exhibit here illustrated is a cut-off fitting intended to take 250w. or 400w. horizontally burning mercury vapour lamps. It is to be noted that this lamp used with this reflector can be burned in the horizontal position without any magnetic deflector being necessary. The position of the lamp can be varied so as to modify the angle of cut-off.

Small "Oxford" Lantern.



Cut-off lantern for horizontal burning discharge lamp.

Investigations of Appearance of Lighted Streets by Method of Double Projection.

Mr. J. M. Waldram (G.E.C. Research Laboratories) in describing this device, explained that the satisfactory appearance of lighted streets is not the same as the visibility of objects in the street, for it is determined by the opinions of users who view the street often in the absence of any objects. In order to specify completely the lighting system it is necessary to know what characteristics of the brightness distribution result in a "patchy" appearance and what are considered satisfactory.

Such problems may be studied in the laboratory with the help of two similar projection lanterns operating simultaneously on one screen. The projectors may be used in two ways:

(1) Each projector projects a standard representation slide of one light source and its associated bright area formed on some known road surface; and, by moving one of the projectors or by the use of different slides, the two bright areas may be juxtaposed in various ways, enabling the effects of varying spacing or positioning of the sources to be studied. The combined result on the screen may be photographed and its brightness distribution studied by the method of photographic photometry.

(2) The two projectors each project a slide of a complete installation, one lighted very evenly and one very unevenly. By superimposing the slides exactly and by suitably dimming the projectors, any degree of unevenness, between the limits of the two pictures, may be produced. The just tolerable result my be photographed and recorded as before.

A New Portable Photoelectric Illumination Meter.

This apparatus was shown by Mr. J. S. Preston (National Physical Laboratory). The instrument uses as light-sensitive element an emission photocell of standard type. It combines portability with the advantages possessed by this type of cell for measuring low values of illumination, namely stability and absence of fatigue, low temperature coefficient of sensitivity, and the comparatively high wattage output obtainable which permits of amplification of the photo-current.

Use of an amplifier necessarily places a lower limit on the weight and compactness of the instrument, but it is possible to dispense with certain of the heavier components while retaining the electrical steadiness of the valve bridge circuit. The photocell is coupled to the amplifier valve by a 500 megohm resistor of negligible temperature coefficient of resistance, while the overall sensitivity is further raised by the use of low-consumption, high-μ valves and a bridge galvanometer of a robust reflecting type, the lamp for which is fed from the low tension supply to the amplifier.

Readings in foot-candles are taken on a calibrated voltmeter (with provision for external potentiometer for precision work); and a simple range-changing device may be included in the electrical

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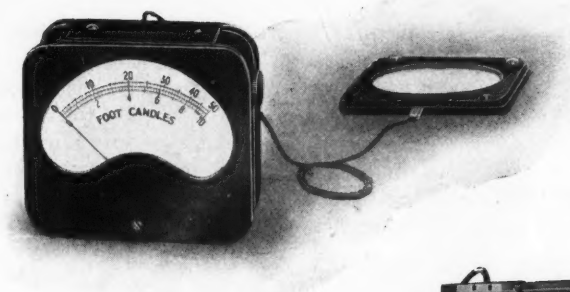
EVERETT EDGCUMBE make a complete range of PHOTOMETERS employing the well-known **AUTOPHOTIC CELL** for every kind of light measurement.



Hand Auto-Photometer

Street Lighting Photometer

Model A

Holophane-Edgcumbe Photometers are operated by Autophotic cells, a self-exciting device which, when exposed to light, produces a current proportional to the luminous flux. Measured by a suitable instrument this current gives a direct reading in foot-candles. No battery, comparison lamp or other accessories are employed.

- **AUTO-PHOTOMETER** for demonstrating the illumination in large and small spaces. A minimum full scale reading of 2.5 foot-candles can be provided on the lowest range, and there is no practical limit to the maximum range. The separate Autophotic cell can be placed in any position independent of the indicator.

- **STREET LIGHTING PHOTOMETER.**—Measurement of illumination as low as 0.005 foot-candles (which is half the recognised minimum) is now possible with this remarkable instrument. True indications at large angles of incidence, accuracy with lights differing widely in colour, and complete portability are other features.

- **LIGHT METER** with self-contained test surface. Minimum full scale 25 foot-candles. Is a direct reading pocket Photometer for demonstrating the level of illumination in workshops, factories, shops, schools, offices, etc.

Light Meter

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circuit. The photocell is placed behind a disc of Ilford Diffusing Medium which forms the test surface, and which gives an efficiency for obliquely incident light equal to that of the matt opal glass plates used with visual instruments. Provision is made for a colour-correction filter between the photocell and the diffusing disc.

The complete instrument comprises two aluminium boxes connected by an 8-core flexible. The smaller box houses the photocell, valves, and resistors, while the larger contains the dry H.T. battery, galvanometer and key, measuring voltmeter, and two small grid potentiometers. A small unspillable 4-volt accumulator is also necessary for the L.T. supply to valves and galvanometer lamp.

On the most sensitive range, full scale deflection corresponds to a normal illumination of the order of 0.05 foot-candle, and the sensitivity permits of a precision of $\pm$ 1 per cent. on a reading of one tenth of this value.

A Telephotographic Method for Measuring the Flashed Area of Projectors.

Mr. H. J. A. Turner, (G.E.C. Research Laboratories) dealt with the colour apparatus. In development work on high intensity long-throw projectors the extent to which various parts of the optical system direct light into the beam is often a matter of importance. Parts of the optical system performing this function will appear "flashed" from a distance view-point, i.e., in them will be seen an image of the light source. The extent to which the optical system is "flashed" will depend on

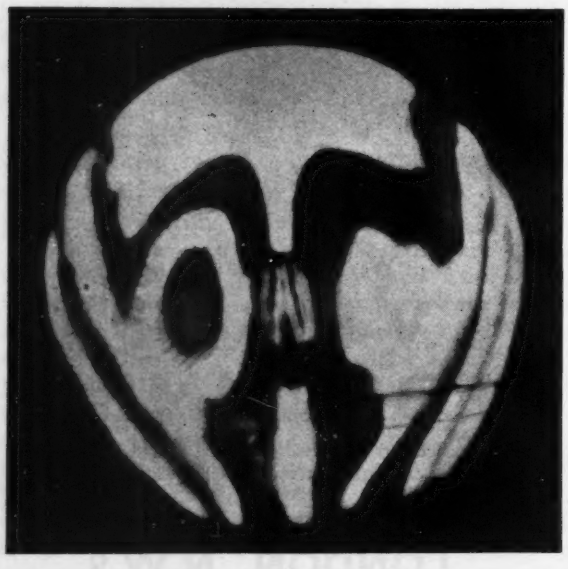
(1) The size and shape of source.

(2) The accuracy of the reflector or refractor contour, including the effects of the thickness of the glass in a back-silvered mirror.

(3) Obstruction due to the lamp bulb.

Any reduction of flashed area due to these causes can be found by photographing the mirror from a distance of the same order as that at which the projector is intended to work.

The simple apparatus demonstrated uses a 4½-inch diameter, 64-inch focal length, astronomical objective to form an image of the projector, which is then magnified and focussed on to a photographic plate by a second lens.

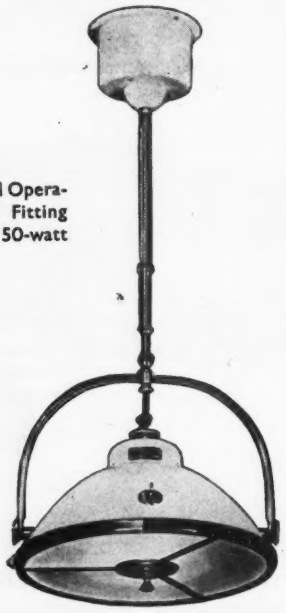


Flashed Area Telephotograph of a Paraboloidal Mirror with a 500-watt Projector Lamp.

Apart from giving a permanent record of the flashed area, photographs obtained with the aid of such a camera are also useful as a check on peak intensity measurements from projectors. The flashed area may be measured on the photograph by means of a planimeter, and the product of this and the mean brightness of the image gives the order of the intensity in the direction of view of the camera.

A Hospital Operating Theatre Fitting.

Mr. J. M. Sanford (General Electric Co., Ltd.) described the above fitting, which has a special optical system designed on the lines of the 36-in. unit described in 1936 and collecting approximately 90 per cent. of the lamp flux for redistribution over the working area. A one-piece spun and plated metal reflector is substituted for the more efficient silvered glass system used with the larger equipment, thus cheapening and strengthening the structure. This unit is intended for application to dental surgery or minor operations.

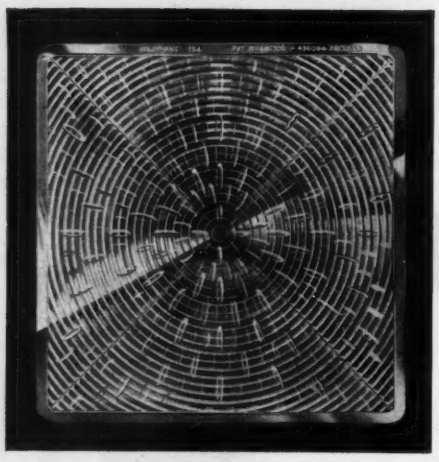


A 24-in. G.E.C. Hospital Operating Theatre Lighting Fitting equipped with one 150-watt filament lamp.

It is constructed for use with a standard 150-watt clear filament lamp and furnishes an average illumination of 450 foot-candles over a 12-in. diameter patch 3 ft. vertically below the base. A secondary system, in case of failure of the main source of supply, is also embodied.

A self-locking telescopic downrod has been developed, so designed as to safely support fittings weighing upwards of 70 lb. suspended on it. When correctly balanced, however, the fitting can be made to descend upon application of only slight pressure, although the weight of the lighting unit, which in this case is only 40 lb., must be overcome when movement is required in an upward direction.

Mr. Sandford also exhibited a combined tungsten-discharge diffusing fitting, capable of accommodating three gas-filled (filament) lamps and one discharge lamp, having a partially open bottom and equipped with the special quick release gallery exhibited last year. Such units are of special interest in view of the suitability of the 80 and 125 w. discharge lamps for combination units.

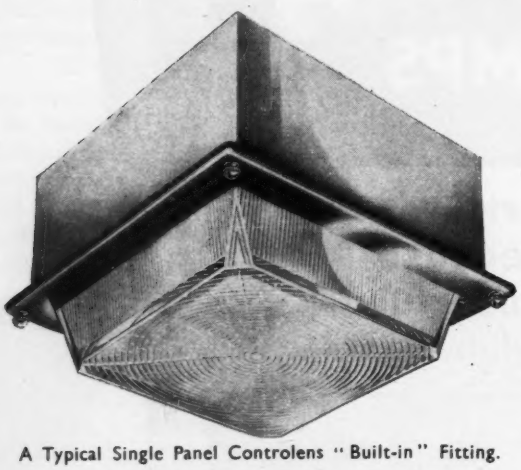


Holophane Intensive Type of Controlens (12″ square).

Prismatic Plates and Dishes.

Mr. E. Stroud (Holophane, Ltd.) introduced a new series of Holophane prismatic Controlens Plates and Dishes for use with "Built-In" interior lighting.

The series consists of 12-in. square flat lens plates, 12-in. circular lens plates having a slight projection, and 12-in. square dropped lens plates with a 2¼-in. projection. With this series a new optical system is employed, the prisms being designed to control and redirect the light rays from two light sources—lamp and reflector—thus giving a higher efficiency than has formerly been possible in architectural or "Built-In" lighting fittings. The direct rays from the lamp are refracted at equal and opposite angles to those reflected from a concentrating top reflector used in combination with the Controlens. By this means a



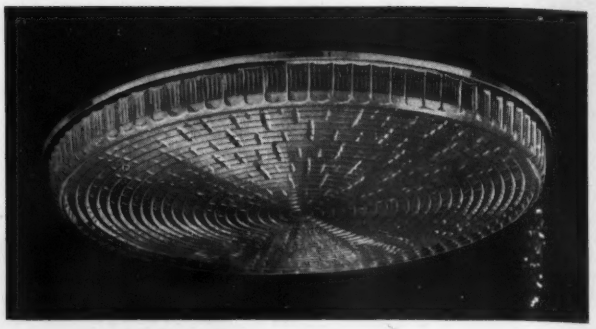
A Typical Single Panel Controlens "Built-in" Fitting.

light distribution from a complete unit is given which ensures a high intensity illumination over a 15°-20° zone suitable for general interior lighting from units fixed at the ceiling level having a spacing of from 1 to 1.3 times their height from the floor.

The controlenses with their reflectors are built up in suitable box fittings to form single or mutiple panels, each Controlens having its own individual lamp. By this method small or large size fittings can be supplied with wattages suitable for varying heights or illumination intensities.

The combinations are also made in three types of fixing, i.e., flush, semi-recessed, and close ceiling.

The flush units are entirely recessed into the ceiling, and would be generally used for installation in false ceiling locations. The units are constructed in two sections: a metal box containing the reflector,



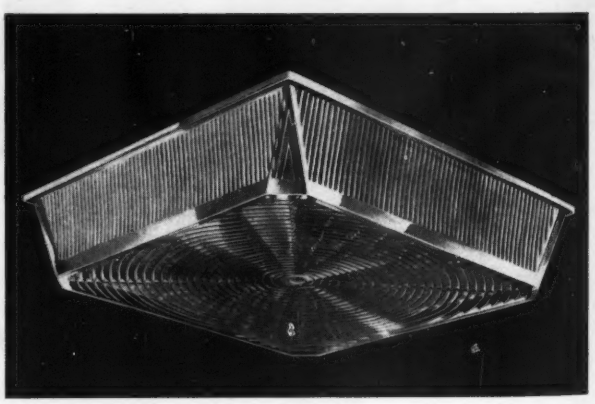
Circular Controlens.

lampholders and necessary supporting device, and a metal flange which carries the Controlens and which is fastened to the recessed box and frames the plaster opening.

The semi-recessed types are arranged with a part of the unit recessed and the remainder exposed. This type is generally chosen because of a lack of sufficient depth in the ceiling for complete recessment, or the desire for more ornamentation in the lighting system. The exposed frame carries the Controlens in the base, the side panels being glazed with white diffusing or coloured glass as required.

The surface units are used where the equipment is mounted directly on to the ceiling, with no part or only the outlet box being recessed.

The semi-recessed and surface types lend themselves for ornamentation of varying degrees. Louvres and fins of all sizes and shapes may be added to the frame design, which can be plated or colour sprayed as required. Such treatment will not affect the lighting efficiencies of the system.



A Square Controlens Dish (12″ square).

Flameproof Floodlights, etc.

Mr. J. E. Parker (General Electric Company, Ltd.) showed a 500-watt flameproof floodlight for use in oil depots, petrol wharves, etc. It is constructed of Alpax aluminium alloy and has a stainless metal reflector to give the necessary spread and a ⅜-in. armour plate front glass capable of withstanding a pressure of 75 lb. per square inch.

A second exhibit by Mr. Parker was a floodlight housing a 400w. h.p. electric discharge lamp burning horizontally. In 1936 a unit of this type equipped with a magnetic deflector to keep the light stream central was exhibited. A glass has now been developed which withstands the temperature and renders the magnetic deflector unnecessary. The efficiency for horizontal burning is reduced by only 4-5 lumens per watt. Green, blue, and yellow screens can be used with this unit.

Loss of COLOUR *loses sales*

Perhaps the goods are navy-blue but if they lose their colour because of the lighting, you may lose a sale. The excess yellow in ordinary artificial lighting makes almost all colours lose their life and brilliance and become dull or distorted. But science has solved this problem, simply, efficiently, economically. The answer is Crompton Neophan Glassware—a series of beautiful opal glass fittings for use with ordinary electrical lamps. The secret of Neophan is the introduction into the glass of the oxide of the recently discovered element Neodym, with a resultant spectrum which corrects any excess of yellow.

Crompton Neophan fittings give a soft, evenly diffused light with the natural warm colour effects of daylight—pleasant to look at and easy to see by.

Instal CROMPTON NEOPHAN GLASSWARE

FOR TRUER COLOUR IN ARTIFICIAL LIGHT

CROMPTON PARKINSON LIMITED, BUSH HOUSE, LONDON, W.C.2

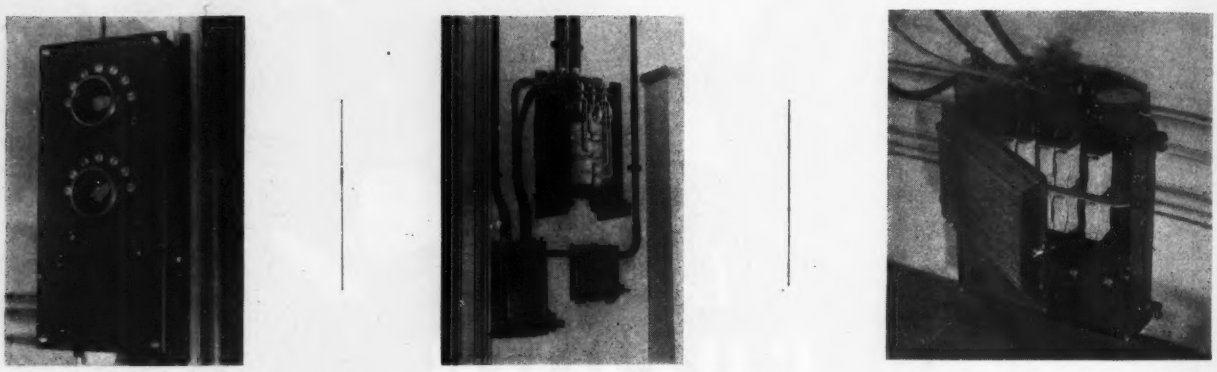
New Method of Frieze Lighting.

Mr. Harold Bright showed three new developments in lighting, two of which were on view and the third was described and illustrated by lantern slides.

The first exhibit was a full-scale section of a new type of frieze lighting employing discharge tubes behind prismatic glass plates. Three tubes were used, namely, red, green, and blue, and dimmers were provided, enabling a great variety of colours to be obtained Two types of prismatic glass were used, one of which had vertical lenses on one face and horizontal prisms on the other, and the effect of the light as distributed by this was of luminous mother-of-pearl. The full load consumption was only 22 watts per linear foot, and the full depth of the glass plates, amounting to 2 ft., was satisfactorily illuminated.

Lighting Equipment for the Chemical Laboratory.

A model was shown of lighting equipment designed for use in a chemical laboratory, in volumetric analysis. A burette and titration beaker were arranged on a stand. A tube having an opal slit was supported at the back of the burette and illuminated by means of a tubular lamp and the beaker stood on a base having an illuminated window in the top. The illuminated slit enabled the meniscus of the liquid in the burette to be very easily seen, and the colour-corrected light beneath the beaker enabled the change in colour of the indicator to be seen without difficulty. The use of special coloured filters to enable the change in the colour of the indicator to be more easily seen was also suggested.



Equipment for Studio Lighting.

Lighting for a Photographic Studio.

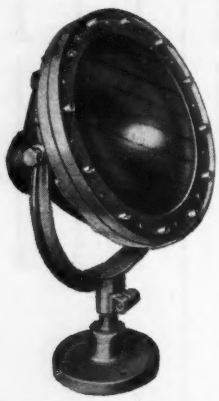
The application described but not shown was an installation of over-run lamps in a commercial photographic studio. This installation is a development of a single lighting unit shown at last year's opening meeting, and of research work described in the British Journal of Photography's Almanac for 1937. The feature of this installation is that the over-voltage required for the lamps is obtained from a tapped auto-transformer, tap changing switches being provided to enable the voltage to be changed and applied to the lamps gradually. 12 kW. of over-run lamps are provided, and extremely short exposures for the photographs are possible. An interesting example of the possibilities of this type of lighting and control was shown in two lantern slides which were made from negatives taken of the same subject without moving either the camera, model, or lighting apparatus, the change from strong front lighting to strong back lighting being made entirely by moving the tap changing switches.

We are indebted to the British Journal of Photography for the use of these blocks illustrating the lantern slides shown by Mr. Bright before the Illuminating Engineering Society on October 12. The adjacent pictures certainly furnish a striking example of the change in conditions of light and shade that may be effected by quite simple means.

Some Ediswan Developments.

Several novel lighting units were shown by Mr. A. Mansell (Edison Swan Electric Company, Ltd.). The "London Minor" lantern shown below in appearance resembles the familiar "London Major" type, but is intended for use with the new 80 and 125-watt Escuraelectric discharge lamps. Two patterns are available, one giving non-axial asymmetrical distribution with 155° between beams (suitable for side of road mountings) and the other symmetrical distribution for general lighting (and in some cases for centre of road mounting). No focussing arrangement is embodied as it has been found that, with lamps having pearl bulbs, variation in the light-centre length has little effect on the distribution within the specified limits. By merely fitting the correct holder the lantern may be adapted to 100, 150, or 200-watt lamps. The lantern is clearly marked to show its correct position relative to the road and the refractor can only be fitted in its proper position. The lantern with its outer globe is totally enclosed and dust-proof. The smooth exterior does not harbour dust and is easily cleaned.

The "London Minor" Street Lantern.

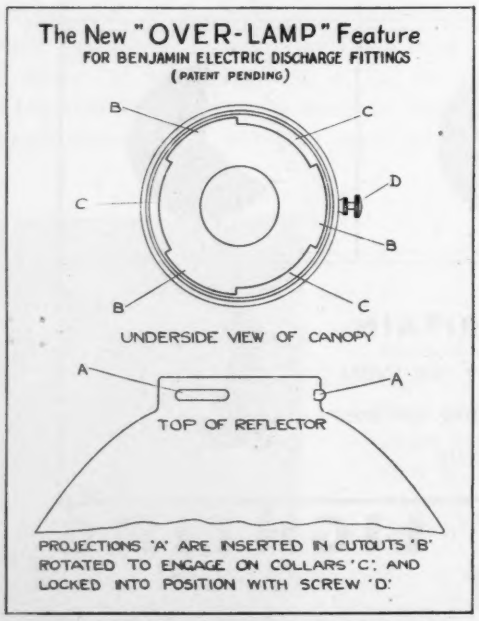


A Submersible Floodlight Projector.

A Unit for Railway Stations.

The submersible floodlight projector is designed mainly for use with fountains, etc., and utilises a special heat-resisting silvered glass reflector. The interior is fitted with a colour glass frame and the heavy cast front, to which is fixed a heavy, heat-resisting domed glass, is attached to the main projector by 12 bolts. The unit will accommodate either 500-watt or 1,000-watt projector type lamps. A feature is the novel means by which the front can be removed with the aid of four special screw holes. These permit bolts to be screwed in so as to prise the front away from the casting—a very useful device in view of the fact that these units are submerged for considerable periods and often become coated with deposits of barnacles, etc.

The third unit described, the railway fitting, which has recently been installed at King's Cross station, is intended to furnish cheerful general lighting, giving a strong illumination in a vertical plane. The lantern is of pleasing appearance and the one-piece enclosing globe (mainly of cased opal) gives good diffusion and serves to minimise glare. Although the effect is "general" the design is such that much more light is delivered below the horizontal than is the case with the ordinary diffusing globe. Two sizes of fittings are available.



Details of Benjamin "Over-Lamp" Dispersive Reflector.

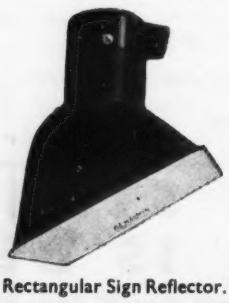
Three Benjamin Units.

The three units illustrated below were shown by Mr. W. Imrie Smith (Benjamin Electric, Ltd.).

The "Overlamp" unit preserves the heat-dissipating devices of the "Saaf-lux" system, and embodies a device definitely securing the reflector in such a way as to render it completely dustproof, whilst still being readily disconnected.

The rectangular sign reflector is used for overhead lighting of posters, the shape being so adjusted as to minimise uneven illumination along the upper part of the sign.

The combination unit permits complete blending of the two types of light. Advantage is taken of the efficiency of the discharge lamp, and the partial colour-correction enables it to be used where electric discharge units alone might not be acceptable.



Rectangular Sign Reflector.

Combination mercury discharge and tungsten filament lighting unit.

(To be continued.)

Electric Street Lighting

Hull.—On October 13 an E.D.A.-E.L.M.A. conference was addressed by Alderman W. Holwell, who traced recent developments in electric lighting and summarised progress in the vicinity. Subsequently, a film illustrating street lighting problems was shown by Mr. R. Maxted, and visitors were taken on a tour of inspection of streets in the neighbourhood.

Hackney.—The street-lighting improvement scheme, which is to cost £74,400, and is of a far-reaching character, has now been inaugurated (see p. 315).

Hornsey.—The council's application for consent to borrow £35,000 for electric street lighting recently came up for consideration. The total annual cost of the proposed scheme is rather less than £10,000, excluding loan charges.

Banstead.—The extension of the electric street lighting, which was installed as a nucleus, is now being considered by a special committee.

Croydon.—The Dunheved-road area is to be relighted by the installation of twelve electric lamps.

Barnes.—Arrangements have now been approved to complete the electric street lighting.

Winchelsea.—Sixteen electric lamps, the first public lighting since oil lamps were discontinued many years ago, are now to be installed.

Leyton.—Following the improvement of lighting in main roads, some twenty-five major side roads are to be lighted with 125-watt quartz type mercury electric discharge lamps, 18 ft. high.

Peterborough.—The first section of the new £8,000 sodium lighting scheme is now in operation, and important further progress will be made during the present month.

Taunton.—It is proposed to arrange for lighting with mercury electric discharge lamps in the main streets of the town.

Literature on Lighting

(Abstracts of Recent Articles on Illumination and Photometry in the Technical Press)

(Continued from Page 304, October, 1937)

II.—PHOTOMETRY.

284. A Portable Phototube Unit Using an R.C.A. 954 Tube.

C. H. Gabus and M. L. Pool. Rev. Sci. Insts., 8, 196-198, 1937.

The problem of the amplification of minute photo-electric currents by means of standard radio apparatus is discussed, and a common reason for failure to obtain high sensitivity is pointed out. F. J. C. B.

285. Photoelectric Spectro-Photometry.

G. Kortum. Angew. Chem., 50, 193-204, 1937.

A survey is given of the suitability of subjective, photographic, and photoelectric methods of measurement. F. J. C. B.

286. Photography Photometry.

F. E. Ross. Astrophys. J., 84, 241-269, 1937.

A full description is given of the thermoelectric photometer used by the author, including the viewing telescope, the motion of the plate carriage, the photometric lamp, the centring of the star image, the galvanometer scale, and the speeds of measurement. F. J. C. B.

287. Photoelectric Photometry in the Printing of Amateur Negatives.

Clifton M. Tuttle. Frank. Inst. J., 224, pp. 315-337, September, 1937.

The article deals with the application of photoelectric control to photo-finishing. The criterion of total density of the negative was found in tests to give as good accord with popular selection as the work of competent finishers, for practical purposes. The question of choice of grade of paper presents a problem, which, however, should not prove a serious obstacle. The importance of controlled negative development is stressed, and the advantages of automatic printing are summarised. S. S. B.

288. The Theory of Three-Colour Reproduction.

Arthur C. Hardy and F. L. Wurzburg. Jr. J. Opt. Soc. Amer., 27, 227-240, 1937.

The theoretical requirements for exact colour reproduction are given, and the best-known media for its practical realisation are discussed. F. J. C. B.

289. Influence of Colour, Tint, and Satiation on the Photometry of Heterochromatic Sources.

A. Dresler. Das Licht, No. 10, October 10, 1937.

Individual impressions as to the brightness of variegated light sources have been investigated by the author with the object of enabling the spectral-sensitivity-diagram to be internationally fixed on the basis of new measurements with the Flicker Photometer. This method is regarded as the only one of practical service in heterochromatic photometry. H. L. J.

290. Analysis of the Effect of "Inter-Reflection" in an Infinite Cylinder: Application to Architectural Lighting.

Z. Yamauti. R.G.E., Vol. 42, No. 12, pp. 293-299, September 4, 1937.

A mathematical treatment of the problem. Experimental checks in the calculations give good agreement. W. R. S.

IV.—LIGHTING EQUIPMENT.

291. Specification for Testing Semi-Indirect and Indirect Luminaires.

Committee of Illuminating Engineering Society of America. Am. Illum. Eng. Soc. Trans., 8, pp. 827-833, September, 1937.

A complete specification for the testing of semi-indirect and indirect lighting units is given, with a recommended data sheet for recording performance. J. S. S.

292. Lighting Designs.

Anon. Elect., 119, pp. 354-355, September 24, 1937.

Two pages of photographs are given of new designs of lighting fittings for the new lighting season. C. A. M.

293. Lighting.

Anon. El. Rev. Vol. CXXI., No. 3,124, p. 465, October 8, 1937.

Describes, with photographs, some of the latest types of decorative fittings for home lighting. R. G. H.

294. More Light with Less Maintenance.

Anon. El. Journal, Vol. 34, No. 9, p. 364, September, 1937.

Describes, with photographs, an industrial lighting fitting which is dust-tight, and therefore requires little maintenance. The fitting employs a heat-treated front glass which will withstand considerable temperature shock, and which will not splinter. R. G. H.

295. Coloured Headlights for Motor-Cars.

Anon. El. Rev., Vol. CXXI., No. 3,124, p. 498, October 8, 1937.

Summarises a recent report of the Department of Scientific and Industrial Research, the main conclusions of which are that there appear to be no definite advantages in the use of coloured light obtained from white light by means of filters as compared with unfiltered white light. R. G. H

296. Polaroid and the Headlight Problem.

Edwin H. Land. Frank. Inst., J., 224, p. 269, September, 1937.

The author describes the principle of polarisation of light, and outlines the development of methods of producing polarisation from early times. A description of the method of production and use of polaroid is included. S. S. B.

297. Signals for Level Crossings.

J. Bilek. Elektrotechniky Obzor, September 9, 1937.

New road signals on unprotected level-crossings are described. A special feature is a device to indicate automatically whether they are in good working condition. H. L. J.

298. Street Lights Controlled by 200 Photo-cell Units.

Anon. El. World, 108, pp. 1,028-30, September 25, 1937.

Details of the lighting arrangements of Buffalo, U.S.A., are given, together with the steps in modernisation being taken. A four months' test on photoelectric control of switching of the lights proved very satisfactory, and this method of control has been extended to operate over 200 lighting circuits. A record is given comparing the operation of this control with clock-operated control and sunset and sunrise times. Interesting data are quoted, obtained from tests on the installation. S. S. B.

V.—APPLICATIONS OF LIGHT.

299. Standards of Lighting Sight-Saving Classrooms.

Committee of Dept. of Education, Columbus, Ohio. Am. Illum. Eng. Soc. Trans., 8, pp. 807-814, September, 1937

Suggested regulations of the lighting of classrooms for children with defective sight are given, together with a discussion of the factors governing these suggestions. J. S. S.

300. Brightness, Distribution, and Control of Classroom Lighting.

R. L. Dearborn. Am. Illum. Eng. Soc. Trans., 8, pp. 785-806, September, 1937.

This paper describes a practical investigation of the best lay-out and of the selection of equipment for school

lighting, and details are given of the special graded colour-scheme chosen. Automatic control of the artificial light is used where daylight is deficient. J. S. S.

301. Home Lighting.
M. Chalmers. El. Rev., Vol. CXXI., No. 3,124, p. 463, October 8, 1937.
Discusses the provision of adequate lighting in the home. The lighting should be considered an important factor in the design of the home, and should therefore be planned from the start, so that the best positions for points and fittings can be found. R. G. H.

302. Lighting a Drug Store.
H. T. Yopp. Magazine of Light, VI., pp. 28-30, September, 1937.
The new lighting equipment of a drug store, including a laylight and ceiling-recessed direct lighting units, is described with a photograph. C. A. M.

303. Stores Lighting.
Anon. Elect., 119, p. 323, September 17, 1937.
Details with photographs are given of new lighting equipment, including floodlights, installed at a large London stores. C. A. M.

304. Light and Architecture.
Anon. Am. Illum. Eng. Soc. Trans., 8, pp. 779-784, September, 1937.
Some representative architectural lighting schemes are described with photographs. J. S. S.

305. Light and Architecture in England.
Waldo Maitland. Am. Illum. Eng. Soc. Trans., 8, pp. 815-826, September, 1937.
This paper gives an account of the tendencies of architectural lighting in England, followed by a detailed description of the installation in the new building of the Royal Institute of British Architects in Portland-place, London. J. S. S.

306. Harvard Print Shop Modernises Lighting.
Anon. El. World, 108, p. 890, September 11, 1937.
Details are given of a lighting installation in a composing room of a printing plant in U.S.A. Combined low-pressure mercury vapour and tungsten filament lamps in special fittings are used, and an illumination of 40-foot candles is supplied. S. S. B.

307. Industrial Lighting in the U.S.A.
W. C. Brown. R.G.E., Vol. 42, No. 12, pp. 377-380, September 18, 1937.
Industrial lighting is now attracting considerable interest in the U.S.A., and the I.E.S. of America has inaugurated a considerable amount of study and enquiry into the subject. This article deals with some of their findings. W. R. S.

308. Street Lighting.
Anon. Elect., 119, p. 424, October 8, 1937.
A brief description is given of new street lighting installations inaugurated at Hackney and Deptford. At Deptford the smaller size mercury lamps, 80-watt and 125-watt, are used. C. A. M.

309. Progress in Public Lighting.
Anon. El. Rev., Vol. CXXI., No. 3,121, p. 369, September 17, 1937.
A report of the discussions on the electrical papers read at the conference of the Association of Public Lighting Engineers, at Folkestone. R. G. H.

310. New Methods of Road Lighting.
Anon. Elect., 119, p. 405. October 8, 1937.
A brief description is given of recent street lighting developments in France. One lantern described, on a post of special construction, has a 500-watt incandescent lamp for the actual street lighting, with a 280-watt mercury lamp fitted above it for the purpose of illuminating trees. Photographs are given. C. A. M.

311. Synchronised Beacons Mark World's Greatest Bridge.
P. B. Garrett. Frank. Inst. J., 224, p. 338, September, 1937.
A description is given of the line of beacons mounted on the San Francisco-Oakland Bay bridge. S. S. B.

312. The Golden Gate Bridge.
John Worden. Magazine of Light VI., pp. 12-13, September, 1937.
Particulars are given of the lighting equipment used on a large outdoor stage close to the Golden Gate Bridge at San Francisco. Klieglight projectors were used extensively. C. A. M.

313. Lighting of Sport Grounds.
A. Vallat. B.I.P., No. 107, October, 1937.
The requirements for adequate lighting in sport grounds with special reference to tennis, football, cycle, car, and horse tracks, swimming pools, ice rinks and boxing rings are specified and suitable equipment is discussed. H. L. J.

314. Night Sports Lighting.
J. E. Hammond. Magazine of Light VI., pp. 24-25, September, 1937.
An outdoor lighting installation for tennis courts in California is described. A description is also given of the interior lighting equipment of a gymnasium, in which alternate fittings house mercury lamps and tungsten lamps. In both installations the load was distributed over three phases in order to eliminate stroboscopic effects. C. A. M.

315. Theatre Lighting.
Anon. The Magazine of Light, VI., pp. 5-11, September, 1937.
Details with numerous photographs are given of modern lighting equipment in theatre lobbies, foyers, promenades, lounges, and auditoria. C. A. M.

316. Lighting of the "Palace of Light and Electricity" at the Paris 1937 Exhibition.
A. Salomon. R.G.E., Vol. 42, No. 12, pp. 371-376, September 18, 1937.
Gives a full description of the lighting, with diagrams and photographs showing the effects produced. W. R. S.

317. Earls Court Exhibition Centre.
Anon. El. Times, 92, pp. 429-430, September 30, 1937.
Contains a short account, with illustrations, of the lighting in the new Earls Court Building. A colour-changing effect is included in this installation. W. R. S.

318. A Lavish Lighting Display.
H. S. Allpress. El. Rev., Vol. CXXI., No. 3,121, p. 363, September 17, 1937.
Describes, with photographs, the lighting effects of the Paris Exhibition. The use of twin discharge tubes of the luminescent cold cathode type for general lighting and of a faceted trough reflector for street lighting are noted amongst other developments. R. G. H.

319. The Lighting of Parks and Woods on the Left Bank of the Seine: Paris Exhibition, 1937.
A. Pux and R. Cros. R.G.E., Vol. 42, No. 12, pp. 376-377, September 18, 1937.
Considerable use was made of discharge lamps for the lighting of the Bois de Vincennes and other parks for the Paris Exhibition. W. R. S.

320. Stroboscopic Effects from Discharge Lamps.
J. N. Aldington, B.Sc., A.I.C. El. Times, 92, pp. 393-394, September 23, 1937.
The effect of periodic variation in light output of a discharge lamp is discussed and illustrated. Stoboscopic effect can be considerably reduced by wiring on three-phases or by mixing with tungsten light. W. R. S.

321. An Elaborate Bed.
Anon. Elect., 119, p. 341, September 24, 1937.
A San Francisco doctor has constructed a "health" bed. It consists of a four-poster, fitted with infra red lamps (carbon filament type), a tungsten electrode mercury vapour lamp, and banks of lamps for colour therapy. Photographs are given. C. A. M.

322. Tests in Common Use for the Diagnosis of Colour Defect.
M. Collins. Nature, Vol. 140, No. 3,544, p. 569, October 2, 1937.
Describes the Ishihara colour test, which requires the observer to read coloured numerals which appear on coloured backgrounds. This test is considered very reliable and sensitive in the detection of anomalies in colour vision. R. G. H.

Recent Patents

(Abstracts of recent Patents on Illumination & Photometry.)

No. 469,599. "Improvements in or Relating to Means for Producing Multiple Flash Signals."

Svenska Aktiebolaget Gas-Accumulator, April 3, 1936. (Convention, Sweden.)

This specification relates to multiple gas flashers, that is, apparatus in which a primary flasher, comprising a gas pressure operated valve, delivers periodically, when the gas pressure rises sufficiently, a charge of gas to a secondary flasher which divides that charge into a series of separate pulses, thus to produce repeatedly a series of flashes spaced by dark intervals. In order to ensure that each series of flashes contains the same number, regulating means responsive to the pressure in the conduit connecting primary and secondary flashers or in the secondary flasher immediately before the discharge of the primary flasher is arranged to compensate for variations in the discharge of gas during each flashing period by one flasher in relation to the discharge by the other flasher The regulating means may adjust the effective gas displacement of the primary flasher or the pressure in the primary or secondary flasher required to produce discharge.

No. 469,731. "Improvements in or Relating to Combinations of Electric Discharge Devices with Materials Excited to Luminescence by the Electric Discharge."

The General Electric Company, Limited, and Randall, J. T., January 27, 1936.

According to this specification a source of white light comprises cadmium phosphate specially prepared and activated, as described in the specification, which is excited to luminescence by a mercury discharge.

No. 470,348. "Improvements in or Relating to Lamps for Vehicles."

Macintyre, N. Peill, D. M,. and Foote, A. Dated February 13, 1936, March 23, 1936. (Cognate Applications.)

This specification covers a vehicle lamp having a substantially paraboloidal main reflector in a casing, a central opening in the main reflector, and a pair of supplementary reflectors carried by a common carrier in the casing, and each adapted to fill substantially the opening of the main reflector and to complete its curvilinear continuity, separate light sources for each supplementary reflector, the light sources being arranged with respect to their supplementary reflectors to give beams of different nature, for example, different divergence, and means for rotating the common carrier and the two supplementary reflectors to bring either one or the other supplementary reflector into operative position. Contacts are associated with the common carrier for automatically switching on the light source associated with the operative supplementary reflector and switching off the other light source.

No. 470,432. "Improvements in or Relating to Optical Projectors."

The General Electric Company, Limited, and Beggs, S. S. Dated May 29, 1936

This specification describes a spot-lamp for producing a beam of which the divergence is adjustable through a large range of angles, less than 15° to greater than 30° or more, with a substantially uniform illumination of an area covered at all angles of divergence.

The spot-light comprises a source of light and an official system, the light being movable along the axis of the optical system to vary the angle of divergence. Two rules are obeyed by the design. First, the source should be, theoretically, infinitely small, although a commercial projection lamp having its filament in the form of a flat square grid, say, one inch by one inch, is practically satisfactory, and the radiation from it should obey Lambert's law, i.e., that the light emitted at angle θ to the normal to the plane of the source is proportional to cos θ. The second rule is that the normal to the source is the axis of symmetry of the optical system, and this system is such that for some position of the source within the operating range $\tan \phi = k \sin \theta$, where θ is the angle between the axis and any incident ray, ϕ the angle between the axis and the corresponding emergent ray and k is independent of θ.

A design of 2 kilowatt projection lamp with a lens of eleven inches diameter, giving a maximum divergence of 56½° is given in the specification. The front surface of the lens comprises a series of annular prismatic ribs.

No. 470,770. "Improvements in or Relating to Electric Discharge Lamps."

The General Electric Company, Limited, Francis, V. J., and Ryde, J. W. Dated February 20, 1936, February 27, 1936, February 27, 1936, January 12, 1937. (Cognate Applications.)

This specification relates to high-pressure metal vapour discharge lamps giving a high-intensity small source for projection and operating at a pressure at from 10 to 100 atmospheres or more. Various methods of stabilising the discharge are briefly discussed, but according to this specification, the line joining the electrodes which form the terminals of the discharge has on one side of it refractory solid matter, and on the other side a transparent portion of the envelope. The distance between the refractory matter and the transparent portion being so great that when the discharge column is driven towards the refractory matter by forces perpendicular to its length so as to lie stably adjacent to it, the column is so distant from the transparent portion that this portion undergoes substantially no obscuration due to the heat of the discharge.

No. 471,330. "Improvements in or Relating to Electric Discharge Devices."

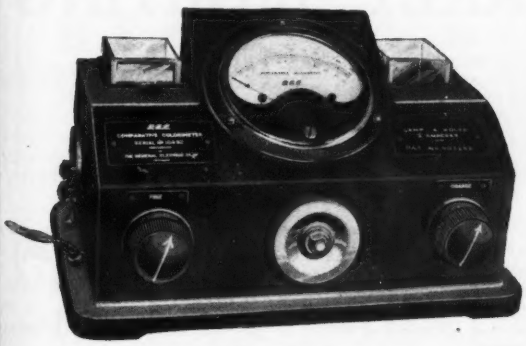
The General Electric Company, Limited, Francis V. J., and Ryde, J. W. Dated March 3, 1936.

This specification is also on a similar subject to that of Nos. 470,770 and 470,809.

A solid body intersects or approaches closely the straight line joining the discharge column electrodes so that when the lamp is operated with the line vertical, part of the column is so far displaced that the column is rendered substantially stable. The solid body may have an edge which may be notched, the discharge taking place through the notch.

A New Photo-electric Colorimeter

The instrument illustrated below comprises a lamp and two similar glass containers for holding liquids, together with a pair of matched photo-electric cells to receive light through the containers. Tests may be made by comparison or deflection, the first being used when the absorption of one of the liquids is known, the second with highly coloured or dull solutions. No visual judgment is involved and a wide range of solutions can be tested. Measurements of the concentration of coloured solutions can be made or components (e.g., the amount of iron in organic pigments) determined. The instrument also facilitates tests of clarity and colour, revealing variations such as may be difficult to differentiate by the human eye in oils, beer and wine, and other liquids.



The New G.E.C. Photo-electric Colorimeter.

Suspension Gear for Overhead Lighting

We have received from Messrs. Walter Slingsby and Co., Ltd., a leaflet illustrating the "Wask" up-and-down suspension gear for overhead lighting, which was widely used for installations (especially those in Clifton-crescent and Gardens, Trinity-crescent, and Radnor Park-road) in connection with the Folkestone Public Lighting Conference, reported in our last issue. The gear enables the lamps to be lowered and brought to the kerb in one simple operation so that the pilot light is never disconnected. Similarly, when applied to electric lamps, the gear involves no disconnection of the supply. The illustration below is interesting as showing the use of the gear fitted to a suspension cable, an application which lighting engineers do not always realise as being possible, as illustrations in general show the more usual column with bracket arm.

A typical instance of the use of "Wask" Suspension Gear in Weston-Super-Mare.

Coloured Light for Motor Car Headlights

It is rarely that an official publication speaks so definitely as the Illumination Research Technical Paper (No. 20), recently issued by the Department of Scientific Research on the above subject. In this country a preference for light of some special colour, because of its alleged fog-penetrating qualities, or supposed freedom from glare, etc., is sometimes expressed. In France legislation compelling the use of headlights using yellow light has actually been imposed.

The Report contains a series of sections in which the following questions are put and answered:—

(a) Can the driver of a car at night see better if he uses headlights emitting coloured light?

(b) Is the disturbance of a driver's vision by the headlights of other cars reduced if they use coloured light?

(c) Can a driver see objects at a greater distance in mist or fog if he uses headlights emitting coloured light?

(d) Can the occurrence of coloured objects and backgrounds be turned to advantage by using headlights emitting coloured light?

The Report is quite definite in stating that "none of the claims made in favour of using a coloured, and in particular a yellow light headlight beam, rather than a white beam of greater power, has been substantiated." The claim for a greater range of visibility in fog may be regarded as definitely disproved. In regard to other claims to less dazzle and greater facility of vision the evidence is inconclusive, but it appears unlikely that any considerable advantage in using coloured light will be revealed by further work.

Public Lighting with Gas

About 1,664 gas lamps are in commission in Sunderland; the majority are suspension lamps, and the numbers of mantles in each lamp vary from two to eight.

About 432 lamps are covered by a renewal by the Mirfield U.D.C. of their contract for gas lighting in the district.

Over 520 gas lamps are covered by the five-year contract in force between the Broadstairs and St. Peter's U.D.C. and the local gas undertaking. Various improvements in the lighting are being carried out.

Thirty-six 4-light gas lamps with directional reflectors have been installed by the Saltcoats Town Council in a new road in the district. The lighting of Saltcoats, which is by gas, about 330 lamps being in use, is governed by a five-year contract, which expires in 1939.

Gas used for public lighting in Lymm, near Warrington, amounted to 2,003,300 cubic feet last year, compared with 1,896,700 the previous year, and 1,638,700 in 1934. The number of street lamps has increased from 199 in 1934 to 219.

Improvements are being carried out in the lighting of New Romney and Greatstoke, under the recent three-year agreement with the local gas undertaking. New Romney is a good example of how efficient public lighting can be installed over quite a small area. None of the eighty-eight lamps have less than three mantles, and directional reflectors are fitted to all lamps.

Public lighting in the area controlled by the Oswaldtwistle U.D.C. cost £1,720 last year, as compared with £1,440 for the previous year. There are 411 gas lamps in the town, and they were responsible for the consumption of 9,028,000 cubic feet of gas during the year.

New or renewed contracts for gas lighting include those at Saxmundham, Stoke-under-Ham (Somerset), and in the villages of Colerne, near Bath, Desborough, Northants (a three-year agreement), Thrapston, Martock, South Petherton, Montacute.

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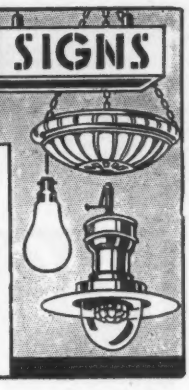

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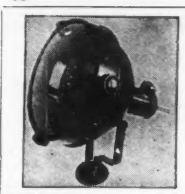

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Index to "Where to Buy"

N.B.—The numbers are those attached to individual entries in the Directory (See pp. 341-343).

Sheffield Illumination Society

On October 26 last Mr. J. F. Colquhoun, public lighting engineer, Sheffield Corporation, addressed members of the Sheffield Illumination Society on "Some Aspects of Street Lighting." Details of some recent improvements in the lighting of Sheffield streets, road safety without the use of motor-car headlights, and the angle separation system evolved for the lighting of bends were amongst the points discussed. It was pointed out that there was no one distribution of light suitable for every kind of road.

Mr. Colquhoun urged that a great deal could be done by providing light backgrounds, and contrasted the effects of dead black, grimy walls under bridges. He instanced a certain railway bridge in Sheffield. Since the addition of a broad white band of paint on the walls, the bridge, which at one time was a danger to motorists, is now a safe roadway because of good visibility.

For traffic routes and busy local thoroughfares lamps 25 ft. high, furnishing about 5,000 lumens per 100 linear feet, were recommended. Other roads should be lighted efficiently using posts 13 to 15 ft. high, and in such a way that those acquainted with the area would find the use of headlights unnecessary, but where it was understood that the onus lay with the driver. In the course of his remarks Mr. Colquhoun expressed doubt whether there was any saving in using sodium or mercury vapour lamps—with electricity at the price at which he was able to obtain it!

After Mr. Colquhoun's lecture two sound films, "Planned Street Lighting," were shown. The films were very kindly loaned by the British Thomson-Houston Company, Ltd., and show some of the many problems that confront the lighting engineer.

The meeting took place in the Corporation Lighting Department, and was presided over by Mr. R. Parker, Vice-President of the Society.

Catalogues and Advertising Literature

We invite all firms in the Lighting Industry to send us new catalogues as they appear, for reference in these columns

CROMPTON, PARKINSON, LTD.—Catalogue of "Crompta" Discharge Lighting. In addition to standard lamps, glass-steel diffusers, elliptical angle, and other special reflectors are illustrated.

J. A. CRABTREE AND CO., LTD.—Complete list of electrical accessories (lamp holders, switches, ceiling roses, switches, etc.).

FALK STADELMANN AND CO., LTD.—Catalogue of "Characteristic Portable Lamps." Besides table lamps and floor standards of conventional patterns, some special table units featuring old Chelsea figures or figures of more modern type are shown.

GENERAL ELECTRIC COMPANY, LTD.—Catalogue of G.E.C. Ironclad Switchgear. Besides switch and fuse gear, circuit-breakers, air thermostats, small transformers, etc., are included.

LUSTRAY PRODUCTS.—List descriptive of the "Lumophor" fluorescent glass tubes, furnishing light in a variety of colours.

J. H. TUCKER AND CO., LTD.—"Telaccessories" price list, including particulars of switches, etc.

Public Works, Roads and Transport Exhibition

The above exhibition and congress takes place at the Royal Agricultural Hall (London, N.) during November 15-20. An interesting and varied programme has been arranged, which includes a paper on November 16 by Mr. C. H. Woodward on "Photometry in Public Lighting."

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